CLAIMS

1. Process to make an emitter (10; 13) for light sources, which can be led to incandescence through the passage of electric current, characterized in that a layer made of anodized porous alumina (1) is used as sacrificial element for the structuring of at least a part of the emitter (10; 13).

2. Process according to claim 1, characterized in that said structuring consists in obtaining at least one between

- a plurality of nanometric reliefs (12) arranged according to a basically predefined geometry on at least a surface of the emitter (10),
- a plurality of nanometric cavities (15) arranged according to a basically predefined geometry within the emitter (13).

3. Process according to claim 2, characterized in that the alumina layer (2) is obtained through consecutive anodizations of an aluminum film (6) deposited onto a surface of a corresponding substrate (2), until a regular alumina structure is obtained, which defines a plurality of pores (4) basically perpendicular to said surface of the substrate (2), the alumina layer (2) having a non-porous portion (5) close to the respective substrate (2).

4. Process according to claim 3, characterized in that the alumina layer (1) is used either as sacrificial template during said structuring or as intermediate template for obtaining a further sacrificial template (10A) for said structuring.

5. Process according to claim 2, characterized in that said structuring includes a step of deposition of material through evaporation, sputtering, Chemical Vapor Deposition, screen printing or electrodeposition.

6. Process according to claim 2, characterized in that structuring includes an etching step.

7. Process according to claim 2, characterized in that said structuring includes a step of anodization of a metal underlying the alumina layer (1).

8. Process according to claim 4, characterized in that said structuring includes the following steps:

- the material (20) designed to make up the desired component (10; 10A) having a plurality of reliefs (12; 12A) is deposited as a film onto the alumina layer (1), a part of said material (20) filling said pores (4), and

- the alumina layer (1) and its substrate (2) are then removed, thus obtaining the desired component (10; 10A), whose reliefs (12; 12A) consist of the part of said material (20) which filled said pores (4).

9. Process according to claim 8, characterized in that said material (20) is deposited onto the alumina layer (1) through sputtering or Chemical Vapor Deposition.

10. Process according to claim 4, characterized in that said structuring includes the following steps:

- the alumina layer (2) is removed from its substrate (2) and opened at its base, removing its non-porous portion (5),

- a conductive metal film (21) is deposited onto the alumina layer (1),

- the material (22) designed to make up a desired component (10; 10A) having a plurality of reliefs (12; 12A) is electrodeposited onto the structure formed by the metal film (21) and the residual part of the alumina layer (1), a part of said material (20) filling said pores (4);

- the residual part of the alumina layer (1) and the metal film (21) are then removed, thus obtaining

the desired component (10; 10A), whose reliefs (12, 12A) consist of the part of said material (20) which filled said pores (4).

11. Process according to claim 4, characterized in that said structuring includes the following steps:

- the material (23) designed to make up the desired component (10; 10A) having a plurality of reliefs (12; 12A) is deposited as a serigraphic paste onto the alumina layer (1), a part of said paste (23) filling said pores (4),
- said paste (23) is sintered, and
- the alumina layer (1) and its substrate (2) are then removed, thus obtaining the desired component (10; 10A), whose reliefs (12; 12A) consist of the part of said material (20) which filled said pores (4).

12. Process according to claim 4, characterized in that said structuring includes the following steps:

- localized parts of the non-porous portion (5) of the alumina layer (1) are removed, so as to open said pores (4) on their substrate (2),
- the material (26) designed to make up a desired component (10; 10A) having a plurality of reliefs (12; 12A) is deposited through electrochemical methods onto the residual part of the alumina layer (1), a part of said material (26) filling said pores (4) and getting into contact with their substrate (2), and
- the residual part of the alumina layer (1) and its substrate (2) are then removed, thus obtaining the desired component (10; 10A), whose reliefs (12, 12A) consist of the part of said material (20) which filled said pores (4).

13. Process according to claim 4, characterized in that the structuring includes the following steps:

- the substrate (2) of the alumina layer (1) undergoes anodization, so as to induce a growth of the

substrate (2) below said pores (4), said growth resulting in the formation of surface projections (2A) of the substrate (2), which first cause parts of the non-porous portion (5) of the alumina layer (1) to break and then keep on growing within said pores (4), and

- the alumina layer (1) is removed through selective etching, a desired component (10) having a plurality of reliefs (12) being thus made by the substrate (2), said surface projections (1A) making up said reliefs (12).

14. Process according to one of the claims 8, 10, 11, 12, 13, characterized in that said desired component is said emitter (10).

15. Process according to one of the claims 8, 10, 11, 12, 13, characterized in that said desired component is said further template (10A).

16. Process according to claim 15, characterized in that said structuring includes the following steps:

- a layer of the material (24, 25) designed to make up said emitter (13) is deposited onto said further template (10A), and

- said further template (10A, 13A) is removed, thus obtaining said emitter (13).

17. Process according to claim 15, characterized in that said structuring includes the following steps:

- a layer of the material designed to make up said emitter (13) is deposited onto said further template (10A, 13A), and

- said further template (10A, 13A) is removed, thus obtaining said emitter (13).

18. Process according to claim 15, characterized in that said structuring includes the following steps:

- a layer of the material designed to make up said emitter (13) is deposited onto said further template (10A, 13A), and

- said further template (10A, 13A) is removed, thus obtaining said emitter (13).

19. Process according to one of the claims 16, 17 or 18, characterized in that the material (24) designed to make up said emitter (13) is deposited onto said further template (10A, 13A) through sputtering or Chemical Vapor Deposition, and in that said further template (10A, 13A) is removed through selective etching.

20. Process according to one of the claims 16, 17 or 18, characterized in that the material (24, 25) designed to make up said emitter (13) is in the form of a serigraphic paste (25), which is sintered after being deposited onto said further template (10A, 13A) the latter being then removed through selective etching.

21. Process according to claim 5, characterized in that said structuring includes the following steps:

- at least a part of the non-porous portion (5) of the alumina layer (1) is removed, said pores (4) being thus opened on their substrate (2),

- the substrate is selectively dug in the corresponding open areas on said pores (4),

- the residual part of the alumina layer (1) is removed, the substrate thus making up said emitter (13), the dug areas of the substrate (2) making up said cavities (15).

22. Process according to claim 21, characterized in that the substrate (2) is dug on said open areas through Reactive Ion Etching or selective wet etching or electrochemical etching.

23. Emitter for light sources, in particular a filament, which can be led to incandescence through the passage of electric current, obtained with the process according to one or more claims 1 to 22, the emitter having at least one between

- a plurality of nanometric reliefs (12) arranged according to a basically predefined geometry on at least a surface of the emitter (10),

- a plurality of nanometric cavities (15) arranged according to a basically predefined geometry within the emitter (13).

24. Emitter according to claim 23, where said reliefs (12) make up an antireflection microstructure, in order to maximize electromagnetic emission from emitter (12) into visible spectrum.

25. Emitter according to claim 23, where said cavities (15) are part of a photon crystal structure.

26. Use of anodized porous alumina (1) as sacrificial element for the structuring of at least a part of an emitter (10; 13) for light sources, which can be led to incandescence through the passage of electric current.

27. Use according to claim 26, where alumina (1) is used as template during said structuring.

28. Use according to claim 26, where alumina (1) is used as template for obtaining a further template (10A, 13A) used during said structuring.

29. Use according to claim 26, where said structuring allows to obtain at least one between

- a plurality of nanometric reliefs (12) arranged according to a basically predefined geometry on at least a surface of the emitter (10),

- a plurality of nanometric cavities (15) arranged according to a basically predefined geometry within the emitter (13).